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**ОТЧЕТ**

по лабораторной работе №2

по дисциплине «Программирование на языке Java»

на тему «Работа с коллекциями объектов»

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**Название**

Работа с коллекциями объектов

**Цель работы**

Изучить библиотеку стандартных коллекций Java Collections Framework, позволяющую хранить различные структуры данных.

**Лабораторное задание**

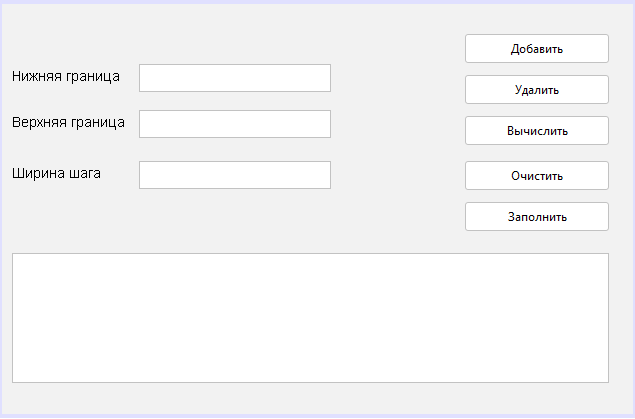
Модифицировать приложение из предыдущей лабораторной работы, реализовав хранение данных таблицы с использованием библиотеки коллекций. Для этого реализовать класс RecIntegral, способный хранить одну запись таблицы. Для нечетных вариантов в качестве класса-коллекции выбрать ArrayList, для четных - LinkedList. Кроме того, добавить пару кнопок: очистить / заполнить, которые будут очищать таблицу и заполнять ее данными из коллекции соответственно. Оформление лабораторной работы должно быть выполнено в соответствии с требованиями, приведенными в Приложении 2.

Вариант 6:



**Ход работы**

**Добавили дополнительные кнопки в интерфейс**

****

**Создали класс “RecIntegral”**

public class RecIntegral {

private double widthLim, lowLim, upLim, resIntegral;

public RecIntegral(double lowLim, double upLim, double widthLim, double resIntegral) {

this.widthLim = widthLim;

this.lowLim = lowLim;

this.upLim = upLim;

this.resIntegral = resIntegral;

}

public double getLowLim() {

return lowLim;

}

public double getUpLim() {

return upLim;

}

public double getWidthLim() {

return widthLim;

}

public double getResIntegral() {

return resIntegral;

}

public void setLowLim(double LowLim) {

this.lowLim = lowLim;

}

public void setUpLim(double upLim) {

this.upLim = upLim;

}

public void setWidthLim(double widthLim) {

this.widthLim = widthLim;

}

public void setResIntegral(double resIntegral) {

this.resIntegral = resIntegral;

}

}

**Добавили функционал в кнопку “Очистить”**

private void jButtonClearTableMouseClicked(java.awt.event.MouseEvent evt) {

// TODO add your handling code here:

DefaultTableModel model = (DefaultTableModel) jTable1.getModel();

int count = model.getRowCount();

for (int i = 0; i < count; i++) {

double lowLim = (double) model.getValueAt(i, 0);

double upLim = (double) model.getValueAt(i, 1);

double widthLim = (double) model.getValueAt(i, 2);

double resIntegral;

Object value = model.getValueAt(i, 3);

if (value instanceof Number) {

resIntegral = ((Number) value).doubleValue();

} else {

resIntegral = Double.MAX\_VALUE;

}

RecIntegral dataIntegral = new RecIntegral(lowLim, upLim, widthLim, resIntegral);

listRecIntegral.add(dataIntegral);

}

model.setRowCount(0);

}

**Добавили функционал в кнопку “Заполнить”**

private void jButtonFillTableMouseClicked(java.awt.event.MouseEvent evt) {

// TODO add your handling code here:

DefaultTableModel model = (DefaultTableModel) jTable1.getModel();

for(RecIntegral dataRow : listRecIntegral) {

double lowLim = dataRow.getLowLim();

double upLim = dataRow.getUpLim();

double widthLim = dataRow.getWidthLim();

if (dataRow.getResIntegral() == Double.MAX\_VALUE) {

model.addRow(new Object[]{lowLim, upLim, widthLim});

}

else {

double resIntegral = dataRow.getResIntegral();

model.addRow(new Object[]{lowLim, upLim, widthLim, resIntegral});

}

}

listRecIntegral.clear();

}

**Листинг**

**Frame.java**

/\*

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\* and open the template in the editor.

\*/

package lab1;

import javax.swing.table.DefaultTableModel;

import java.util.LinkedList;

/\*\*

\*

\* @author student

\*/

public class Frame extends javax.swing.JFrame {

/\*\*

\* Creates new form Frame

\*/

public Frame() {

initComponents();

}

/\*\*

\* This method is called from within the constructor to initialize the form.

\* WARNING: Do NOT modify this code. The content of this method is always

\* regenerated by the Form Editor.

\*/

@SuppressWarnings("unchecked")

// <editor-fold defaultstate="collapsed" desc="Generated Code">

private void initComponents() {

label1 = new java.awt.Label();

label2 = new java.awt.Label();

label3 = new java.awt.Label();

jTextFieldSH = new javax.swing.JTextField();

jTextFieldNG = new javax.swing.JTextField();

jTextFieldVG = new javax.swing.JTextField();

jScrollPane1 = new javax.swing.JScrollPane();

jTable1 = new javax.swing.JTable();

jButtonDel = new javax.swing.JButton();

jButtonRes = new javax.swing.JButton();

jButtonAdd = new javax.swing.JButton();

jButtonClearTable = new javax.swing.JButton();

jButtonFillTable = new javax.swing.JButton();

setDefaultCloseOperation(javax.swing.WindowConstants.EXIT\_ON\_CLOSE);

label1.setFont(new java.awt.Font("Dialog", 0, 14)); // NOI18N

label1.setText("Нижняя граница");

label2.setFont(new java.awt.Font("Dialog", 0, 14)); // NOI18N

label2.setText("Ширина шага");

label3.setFont(new java.awt.Font("Dialog", 0, 14)); // NOI18N

label3.setText("Верхняя граница");

jTextFieldSH.addActionListener(new java.awt.event.ActionListener() {

public void actionPerformed(java.awt.event.ActionEvent evt) {

jTextFieldSHActionPerformed(evt);

}

});

jTextFieldNG.setCursor(new java.awt.Cursor(java.awt.Cursor.TEXT\_CURSOR));

jTextFieldNG.addActionListener(new java.awt.event.ActionListener() {

public void actionPerformed(java.awt.event.ActionEvent evt) {

jTextFieldNGActionPerformed(evt);

}

});

jTextFieldVG.addActionListener(new java.awt.event.ActionListener() {

public void actionPerformed(java.awt.event.ActionEvent evt) {

jTextFieldVGActionPerformed(evt);

}

});

jTable1.setModel(new javax.swing.table.DefaultTableModel(

new Object [][] {},

new String [] {

"Нижняя граница", "Верхняя граница", "Шаг", "Результат"

}

));

jTable1.setRowSelectionAllowed(false);

jTable1.addAncestorListener(new javax.swing.event.AncestorListener() {

public void ancestorAdded(javax.swing.event.AncestorEvent evt) {

jTable1AncestorAdded(evt);

}

public void ancestorMoved(javax.swing.event.AncestorEvent evt) {

}

public void ancestorRemoved(javax.swing.event.AncestorEvent evt) {

}

});

jScrollPane1.setViewportView(jTable1);

if (jTable1.getColumnModel().getColumnCount() > 0) {

jTable1.getColumnModel().getColumn(0).setHeaderValue("Нижняя граница");

jTable1.getColumnModel().getColumn(1).setHeaderValue("Верхняя граница");

jTable1.getColumnModel().getColumn(2).setHeaderValue("Шаг");

jTable1.getColumnModel().getColumn(3).setHeaderValue("Результат");

}

jButtonDel.setText("Удалить");

jButtonDel.addMouseListener(new java.awt.event.MouseAdapter() {

public void mouseClicked(java.awt.event.MouseEvent evt) {

jButtonDelMouseClicked(evt);

}

});

jButtonDel.addActionListener(new java.awt.event.ActionListener() {

public void actionPerformed(java.awt.event.ActionEvent evt) {

jButtonDelActionPerformed(evt);

}

});

jButtonRes.setText("Вычислить");

jButtonRes.addMouseListener(new java.awt.event.MouseAdapter() {

public void mouseClicked(java.awt.event.MouseEvent evt) {

jButtonResMouseClicked(evt);

}

});

jButtonRes.addActionListener(new java.awt.event.ActionListener() {

public void actionPerformed(java.awt.event.ActionEvent evt) {

jButtonResActionPerformed(evt);

}

});

jButtonAdd.setText("Добавить");

jButtonAdd.addMouseListener(new java.awt.event.MouseAdapter() {

public void mouseClicked(java.awt.event.MouseEvent evt) {

jButtonAddMouseClicked(evt);

}

});

jButtonAdd.addActionListener(new java.awt.event.ActionListener() {

public void actionPerformed(java.awt.event.ActionEvent evt) {

jButtonAddActionPerformed(evt);

}

});

jButtonClearTable.setText("Очистить");

jButtonClearTable.addMouseListener(new java.awt.event.MouseAdapter() {

public void mouseClicked(java.awt.event.MouseEvent evt) {

jButtonClearTableMouseClicked(evt);

}

});

jButtonClearTable.addActionListener(new java.awt.event.ActionListener() {

public void actionPerformed(java.awt.event.ActionEvent evt) {

jButtonClearTableActionPerformed(evt);

}

});

jButtonFillTable.setText("Заполнить");

jButtonFillTable.addMouseListener(new java.awt.event.MouseAdapter() {

public void mouseClicked(java.awt.event.MouseEvent evt) {

jButtonFillTableMouseClicked(evt);

}

});

jButtonFillTable.addActionListener(new java.awt.event.ActionListener() {

public void actionPerformed(java.awt.event.ActionEvent evt) {

jButtonFillTableActionPerformed(evt);

}

});

javax.swing.GroupLayout layout = new javax.swing.GroupLayout(getContentPane());

getContentPane().setLayout(layout);

layout.setHorizontalGroup(

layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)

.addGroup(layout.createSequentialGroup()

.addGap(10, 10, 10)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.TRAILING, false)

.addComponent(jScrollPane1)

.addGroup(layout.createSequentialGroup()

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.TRAILING, false)

.addComponent(label2, javax.swing.GroupLayout.Alignment.LEADING, javax.swing.GroupLayout.DEFAULT\_SIZE, javax.swing.GroupLayout.DEFAULT\_SIZE, Short.MAX\_VALUE)

.addComponent(label1, javax.swing.GroupLayout.DEFAULT\_SIZE, 117, Short.MAX\_VALUE))

.addComponent(label3, javax.swing.GroupLayout.PREFERRED\_SIZE, javax.swing.GroupLayout.DEFAULT\_SIZE, javax.swing.GroupLayout.PREFERRED\_SIZE))

.addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING, false)

.addGroup(layout.createSequentialGroup()

.addComponent(jTextFieldVG, javax.swing.GroupLayout.PREFERRED\_SIZE, 192, javax.swing.GroupLayout.PREFERRED\_SIZE)

.addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED, 134, Short.MAX\_VALUE)

.addComponent(jButtonRes, javax.swing.GroupLayout.PREFERRED\_SIZE, 144, javax.swing.GroupLayout.PREFERRED\_SIZE))

.addGroup(layout.createSequentialGroup()

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING, false)

.addComponent(jTextFieldNG, javax.swing.GroupLayout.DEFAULT\_SIZE, 192, Short.MAX\_VALUE)

.addComponent(jTextFieldSH))

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)

.addGroup(layout.createSequentialGroup()

.addGap(134, 134, 134)

.addComponent(jButtonAdd, javax.swing.GroupLayout.PREFERRED\_SIZE, 144, javax.swing.GroupLayout.PREFERRED\_SIZE))

.addGroup(javax.swing.GroupLayout.Alignment.TRAILING, layout.createSequentialGroup()

.addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)

.addComponent(jButtonClearTable, javax.swing.GroupLayout.Alignment.TRAILING, javax.swing.GroupLayout.PREFERRED\_SIZE, 144, javax.swing.GroupLayout.PREFERRED\_SIZE)

.addComponent(jButtonDel, javax.swing.GroupLayout.Alignment.TRAILING, javax.swing.GroupLayout.PREFERRED\_SIZE, 144, javax.swing.GroupLayout.PREFERRED\_SIZE)

.addComponent(jButtonFillTable, javax.swing.GroupLayout.Alignment.TRAILING, javax.swing.GroupLayout.PREFERRED\_SIZE, 144, javax.swing.GroupLayout.PREFERRED\_SIZE))))))))

.addContainerGap(24, Short.MAX\_VALUE))

);

layout.setVerticalGroup(

layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)

.addGroup(layout.createSequentialGroup()

.addGap(30, 30, 30)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.TRAILING)

.addGroup(layout.createSequentialGroup()

.addComponent(jButtonAdd, javax.swing.GroupLayout.PREFERRED\_SIZE, 29, javax.swing.GroupLayout.PREFERRED\_SIZE)

.addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED)

.addComponent(jButtonDel, javax.swing.GroupLayout.PREFERRED\_SIZE, 29, javax.swing.GroupLayout.PREFERRED\_SIZE)

.addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED)

.addComponent(jButtonRes, javax.swing.GroupLayout.PREFERRED\_SIZE, 29, javax.swing.GroupLayout.PREFERRED\_SIZE)

.addGap(16, 16, 16))

.addGroup(layout.createSequentialGroup()

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)

.addComponent(jTextFieldNG, javax.swing.GroupLayout.PREFERRED\_SIZE, 28, javax.swing.GroupLayout.PREFERRED\_SIZE)

.addComponent(label1, javax.swing.GroupLayout.PREFERRED\_SIZE, javax.swing.GroupLayout.DEFAULT\_SIZE, javax.swing.GroupLayout.PREFERRED\_SIZE))

.addGap(18, 18, 18)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)

.addComponent(jTextFieldVG, javax.swing.GroupLayout.PREFERRED\_SIZE, 28, javax.swing.GroupLayout.PREFERRED\_SIZE)

.addComponent(label3, javax.swing.GroupLayout.PREFERRED\_SIZE, javax.swing.GroupLayout.DEFAULT\_SIZE, javax.swing.GroupLayout.PREFERRED\_SIZE))

.addGap(23, 23, 23)))

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)

.addGroup(layout.createSequentialGroup()

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)

.addComponent(jTextFieldSH, javax.swing.GroupLayout.PREFERRED\_SIZE, 28, javax.swing.GroupLayout.PREFERRED\_SIZE)

.addComponent(jButtonClearTable, javax.swing.GroupLayout.PREFERRED\_SIZE, 29, javax.swing.GroupLayout.PREFERRED\_SIZE))

.addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED)

.addComponent(jButtonFillTable, javax.swing.GroupLayout.PREFERRED\_SIZE, 29, javax.swing.GroupLayout.PREFERRED\_SIZE))

.addComponent(label2, javax.swing.GroupLayout.PREFERRED\_SIZE, javax.swing.GroupLayout.DEFAULT\_SIZE, javax.swing.GroupLayout.PREFERRED\_SIZE))

.addGap(22, 22, 22)

.addComponent(jScrollPane1, javax.swing.GroupLayout.PREFERRED\_SIZE, 130, javax.swing.GroupLayout.PREFERRED\_SIZE)

.addContainerGap(31, Short.MAX\_VALUE))

);

pack();

}// </editor-fold>

LinkedList<RecIntegral> listRecIntegral = new LinkedList<>();

private void jTextFieldSHActionPerformed(java.awt.event.ActionEvent evt) {

// TODO add your handling code here:

}

private void jTextFieldNGActionPerformed(java.awt.event.ActionEvent evt) {

// TODO add your handling code here:

}

private void jTextFieldVGActionPerformed(java.awt.event.ActionEvent evt) {

// TODO add your handling code here:

}

private void jButtonDelActionPerformed(java.awt.event.ActionEvent evt) {

// TODO add your handling code here:

}

private void jTable1AncestorAdded(javax.swing.event.AncestorEvent evt) {

// TODO add your handling code here:

}

private void jButtonDelMouseClicked(java.awt.event.MouseEvent evt) {

// TODO add your handling code here:

if(jTable1.getRowCount() != 0)

{

DefaultTableModel model = (DefaultTableModel) jTable1.getModel();

model.removeRow(model.getRowCount()- 1);

}

}

private void jButtonResMouseClicked(java.awt.event.MouseEvent evt) {

// TODO add your handling code here:

if(jTable1.getRowCount() == 0)

return;

int selectRow = jTable1.getSelectedRow();

if(selectRow == -1)

return;

double lowerBorder = (double) jTable1.getValueAt(selectRow, 0);

double upperBorder = (double) jTable1.getValueAt(selectRow, 1);

double weight = (double) jTable1.getValueAt(selectRow, 2);

boolean isReversed = false;

if(lowerBorder > upperBorder)

{

isReversed = true;

double tempBorder = lowerBorder;

lowerBorder = upperBorder;

upperBorder = tempBorder;

}

double tempLowerBorder = lowerBorder;

int count = (int) Math.floor((upperBorder - lowerBorder) / weight);

double sum = 0;

for (int j = 0; j < count; j++) {

sum += ((weight / 2) \* (Math.sqrt(tempLowerBorder) + Math.sqrt(tempLowerBorder + weight)));

tempLowerBorder += weight;

}

if((upperBorder - lowerBorder) / weight > count)

{

tempLowerBorder -= weight;

double lastStepWeigth = upperBorder - (tempLowerBorder);

sum += ((lastStepWeigth / 2) \* (Math.sqrt(tempLowerBorder) + Math.sqrt(upperBorder)));

}

if (isReversed)

{

sum = -sum;

}

jTable1.setValueAt(sum, selectRow, 3);

}

private void jButtonAddMouseClicked(java.awt.event.MouseEvent evt) {

// TODO add your handling code here:

try

{

double widthLim = Double.parseDouble(jTextFieldSH.getText());

double lowLim = Double.parseDouble(jTextFieldNG.getText());

double upLim = Double.parseDouble(jTextFieldVG.getText());

DefaultTableModel model = (DefaultTableModel) jTable1.getModel();

model.addRow(new Object[]{lowLim, upLim, widthLim});

}

catch (NumberFormatException e)

{

// Вывод сообщения об ошибке

javax.swing.JOptionPane.showMessageDialog(this,

"Ошибка ввода! Пожалуйста, введите корректное числовое значение.",

"Ошибка",

javax.swing.JOptionPane.ERROR\_MESSAGE);

}

}

private void jButtonAddActionPerformed(java.awt.event.ActionEvent evt) {

// TODO add your handling code here:

}

private void jButtonClearTableMouseClicked(java.awt.event.MouseEvent evt) {

// TODO add your handling code here:

DefaultTableModel model = (DefaultTableModel) jTable1.getModel();

int count = model.getRowCount();

for (int i = 0; i < count; i++) {

double lowLim = (double) model.getValueAt(i, 0);

double upLim = (double) model.getValueAt(i, 1);

double widthLim = (double) model.getValueAt(i, 2);

double resIntegral;

Object value = model.getValueAt(i, 3);

if (value instanceof Number) {

resIntegral = ((Number) value).doubleValue();

} else {

resIntegral = Double.MAX\_VALUE;

}

RecIntegral dataIntegral = new RecIntegral(lowLim, upLim, widthLim, resIntegral);

listRecIntegral.add(dataIntegral);

}

model.setRowCount(0);

}

private void jButtonResActionPerformed(java.awt.event.ActionEvent evt) {

// TODO add your handling code here:

}

private void jButtonFillTableMouseClicked(java.awt.event.MouseEvent evt) {

// TODO add your handling code here:

DefaultTableModel model = (DefaultTableModel) jTable1.getModel();

for(RecIntegral dataRow : listRecIntegral) {

double lowLim = dataRow.getLowLim();

double upLim = dataRow.getUpLim();

double widthLim = dataRow.getWidthLim();

if (dataRow.getResIntegral() == Double.MAX\_VALUE) {

model.addRow(new Object[]{lowLim, upLim, widthLim});

}

else {

double resIntegral = dataRow.getResIntegral();

model.addRow(new Object[]{lowLim, upLim, widthLim, resIntegral});

}

}

listRecIntegral.clear();

}

private void jButtonFillTableActionPerformed(java.awt.event.ActionEvent evt) {

// TODO add your handling code here:

}

private void jButtonClearTableActionPerformed(java.awt.event.ActionEvent evt) {

// TODO add your handling code here:

}

/\*\*

\* @param args the command line arguments

\*/

public static void main(String args[]) {

/\* Set the Nimbus look and feel \*/

//<editor-fold defaultstate="collapsed" desc=" Look and feel setting code (optional) ">

/\* If Nimbus (introduced in Java SE 6) is not available, stay with the default look and feel.

\* For details see http://download.oracle.com/javase/tutorial/uiswing/lookandfeel/plaf.html

\*/

try {

for (javax.swing.UIManager.LookAndFeelInfo info : javax.swing.UIManager.getInstalledLookAndFeels()) {

if ("Nimbus".equals(info.getName())) {

javax.swing.UIManager.setLookAndFeel(info.getClassName());

break;

}

}

} catch (ClassNotFoundException ex) {

java.util.logging.Logger.getLogger(Frame.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);

} catch (InstantiationException ex) {

java.util.logging.Logger.getLogger(Frame.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);

} catch (IllegalAccessException ex) {

java.util.logging.Logger.getLogger(Frame.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);

} catch (javax.swing.UnsupportedLookAndFeelException ex) {

java.util.logging.Logger.getLogger(Frame.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);

}

//</editor-fold>

/\* Create and display the form \*/

java.awt.EventQueue.invokeLater(new Runnable() {

public void run() {

new Frame().setVisible(true);

}

});

}

// Variables declaration - do not modify

private javax.swing.JButton jButtonAdd;

private javax.swing.JButton jButtonClearTable;

private javax.swing.JButton jButtonDel;

private javax.swing.JButton jButtonFillTable;

private javax.swing.JButton jButtonRes;

private javax.swing.JScrollPane jScrollPane1;

private javax.swing.JTable jTable1;

private javax.swing.JTextField jTextFieldNG;

private javax.swing.JTextField jTextFieldSH;

private javax.swing.JTextField jTextFieldVG;

private java.awt.Label label1;

private java.awt.Label label2;

private java.awt.Label label3;

// End of variables declaration

}

**Lab1.java**

/\*

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\* and open the template in the editor.

\*/

package lab1;

/\*\*

\*

\* @author student

\*/

public class Lab1 {

/\*\*

\* @param args the command line arguments

\*/

public static void main(String[] args) {

// TODO code application logic here

Frame frame = new Frame();

frame.setTitle("Вычисление интегралов");

frame.show();

}

}

**RecIntegral.java**

/\*

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\* Click nbfs://nbhost/SystemFileSystem/Templates/Classes/Class.java to edit this template

\*/

package lab1;

/\*\*

\*

\* @author student

\*/

public class RecIntegral {

private double widthLim, lowLim, upLim, resIntegral;

public RecIntegral(double lowLim, double upLim, double widthLim, double resIntegral) {

this.widthLim = widthLim;

this.lowLim = lowLim;

this.upLim = upLim;

this.resIntegral = resIntegral;

}

public double getLowLim() {

return lowLim;

}

public double getUpLim() {

return upLim;

}

public double getWidthLim() {

return widthLim;

}

public double getResIntegral() {

return resIntegral;

}

public void setLowLim(double LowLim) {

this.lowLim = lowLim;

}

public void setUpLim(double upLim) {

this.upLim = upLim;

}

public void setWidthLim(double widthLim) {

this.widthLim = widthLim;

}

public void setResIntegral(double resIntegral) {

this.resIntegral = resIntegral;

}

}

**Вывод:** В ходе выполнения лабораторной работы изучили библиотеку стандартных коллекций Java Collections Framework, позволяющую хранить различные структуры данных.